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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/670,148	09/24/2003	Stanton M. Keeler	STL11361	7379

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Seagate Technology LLC
1280 Disc Drive
Shakopee, MN 55379

EXAMINER

HEIN, GREGORY P

ART UNIT	PAPER NUMBER
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2188

DATE MAILED: 12/12/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No. 10/670,148	Applicant(s) KEELER, STANTON M.	
	Examiner Gregory P. Hein	Art Unit 2188	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE _____ MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 24 September 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1 - 30 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☐ Claim(s) 1 - 12, 24 - 30 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 September 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some * c) ☐ None of:
1. ☐ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. _____.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- | | |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892) | 4) <input type="checkbox"/> Interview Summary (PTO-413) |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948) | Paper No(s)/Mail Date. _____ |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152) |
| Paper No(s)/Mail Date. _____ | 6) <input type="checkbox"/> Other: _____ |

DETAILED ACTION

Information Disclosure Statement

1. The information disclosure statement (IDS) submitted on 9/24/2003 is in compliance with the provisions of 37 CFR 1.97 except as noted below. Document STL10927.01 is not a U.S. Patent document and is not considered.

Drawings

2. The drawings submitted on 9/24/2005 have been approved by the examiner.

Claim Rejections - 35 USC § 102

3. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

4. Claims 1 – 2, 5 - 12 and 24 – 25 are rejected under 35 U.S.C. 102(e) as being anticipated by U.S. Pre-Grant Publication 2004/0215885 (Cargnoni).

As per claim 1, Cargnoni teaches:

A method for storing data to a data storage device, the method comprising acts of:

- (a) Receiving a write command issued by a sending interface, the write command being accompanied by data and specifying a storage location on the data

storage device to which the data is to be recorded (Cargnoni ¶009 explains the basic operation of a cache memory common to the art. A sending interface is inherent to a cache memory receiving data.);

(b) Upon receipt of the data by the data storage device, storing the data to a first cache memory;

(c) Transferring the data from the first cache memory to a second cache memory;
and

(d) Transferring the data from the second cache memory to the specified storage location pursuant to the write command (Cargnoni ¶10 discloses common cache operation known to the art of evicting cache blocks upon receipt of read or write commands. The evicted cache block is flushed to either the lower cache level or to the main memory dependent on its current cache storage level and modification status.)

As per claim 24, Cargnoni teaches:

A data storage device for storing data received pursuant to a write command issued from a sending interface to the data storage device (Cargnoni ¶30 lines 1 – 5 disclose several different types of storage devices. Cargnoni ¶37 lines 14 – 16 disclose issuing purge commands via a JTAG interface. Line 15 discloses that this interface can also be used to issue read and write commands.), the write command specifying a storage location on the data storage device to which the data is to be recorded (Cargnoni ¶39 discloses including the storage location address in the write command), the data storage device comprising:

A first cache memory for temporarily storing the data upon receipt of the data from the sending interface (Cargnoni ¶10 lines 1 – 5 disclose cache management in response to a read or write command received. It is inherent that to receive a write command a sending interface must be communicatively attached to the cache. If a write command is received the data will be stored into the cache. Cargnoni ¶39 discloses the structure of the data containing address information.); and

Means for storing the data for subsequent transfer to the specified storage location, wherein the storing means receives the data from the first cache memory in response to a first threshold condition being satisfied (Cargnoni discloses in the abstract victimizing L2 cache lines and flushing them to L3. Cargnoni ¶34 lines 12 – 17 disclose flushing cache lines from L3 to the main memory. Cargnoni ¶41 discloses a user defining the flush rate to satisfy a predetermine time interval dependent on software demands.)

As per claim 2, Cargnoni teaches:

The transferring act (c) is performed in response to a predetermined threshold condition being satisfied (Cargnoni ¶41 teaches issuing flush commands to the cache at a user specified rate so that the timing of the rate satisfies a predetermined condition.)

As per claim 5, Cargnoni teaches:

The predetermined threshold condition relates to whether the sending interface has issued a flush command requesting that the first cache memory be cleared of all data, the transferring act (c) comprising:

Transferring the data from the first cache memory to the second cache memory upon receipt by the data storage device of the flush command (Cargnoni ¶34 discloses issuing flush instructions. During flush command execution the L2 and L3 cache are placed in direct-mapped mode (line 7). Cargnoni discloses in the abstract an eviction while in direct-mapped mode will result in a flush from L2 cache to L3 cache.)

As per claim 6, Cargnoni teaches:

The predetermined threshold condition relates to whether data storage and retrieval operations of the data storage device are idle, the transferring act (c) comprising:

Transferring the data from the first cache memory to the second cache memory during a time when data storage and retrieval operations of the data storage device are idle (Cargnoni ¶34 lines 17 – 20 disclose issuing flush commands when the system is running slowly or idle.)

As per claim 7, Cargnoni teaches:

The transferring act (d) is performed in response to a predetermined threshold condition being satisfied (Cargnoni ¶41 teaches issuing flush commands to the cache at a user specified rate so that the timing of the rate satisfies a predetermined condition.)

As per claim 10, Cargnoni teaches:

The predetermined threshold condition relates to whether the sending interface has issued a flush command requesting that the second cache memory be cleared of all data, the transferring act (d) comprising:

Transferring the data from the second cache memory to the specified storage location upon receipt by the data storage device of the flush command (Cargnoni ¶¶34 lines 14 – 17 disclose operation of the L3 purge mechanism and disclose blocks being sent to main memory (line 17).)

As per claim 11, Cargnoni teaches:

The predetermined threshold condition relates to whether data storage and retrieval operations of the data storage device are idle, the transferring act (d) comprising:

Transferring the data from the second cache memory to the specified storage location during a time when data storage and retrieval operations of the data storage device are idle (Cargnoni ¶¶38 discloses running the purge/flush sequence for the L2/L3 cache while the chip cores are idle.)

As per claim 12, Cargnoni teaches:

A program storage device readable by a computer system tangibly embodying a program of instructions executable by the computer system to perform the method of claim 1 (Cargnoni ¶¶41 line 1 discloses "In either the hardware or software implementations, the rate at which the flush instructions roll through the cache can be programmably set..." clearly showing the disclosure of a software program embodied on computer readable medium to implement the flush sequences.)

As per claim 25, Cargnoni teaches:

The first threshold condition relates to whether data storage and retrieval operations of the data storage device are idle (Cargnoni ¶¶38 discloses running the

purge sequence when the chip is idle. Waiting for the chip to reach an idle period is equivalent to wait for the storage device to reach an idle state since all cache operations are executed within the processor.)

All dependent claims are rejected as having the same deficiencies as the claim they depend from.

Claim Rejections - 35 USC § 103

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

6. Claims 3, 4, and 26 rejected under 35 U.S.C. 103(a) as being unpatentable over U.S. Pre-Grant Publication 2004/0215885 Cargnoni et al. in further view of U.S. Patent 6598119 Becker et al..

As per claims 3 and 26:

Cargnoni teaches the claim from which claim 3 and 26 depends. However, Cargnoni does not teach transferring data from a first cache to a second cache in response to the first cache reaching a predetermined fill capacity.

Becker teaches transferring cache data in response to cache being full. Becker Col. 4 lines 53 – 56 teach migrating data out of the cache “when the memory approaches fullness or is full.” It would have been obvious to one of ordinary skill in the art at the time of the invention to combine Becker with Cargnoni since Becker teaches

flushing a size limited cache when the memory approaches being full since a cache is size limited (Becker Col. 4 lines 53 – 56) thus creating room in the cache for more data.

As per claim 4:

Claim 4 is rejected with the same rational as claim 3. The percent of cache in use added to the percent of cache available is exactly equal to one hundred percent of the total cache.

Allowable Subject Matter

7. Claims 13 - 23 are allowed.
8. Claims 27 – 30 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Conclusion

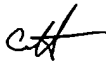
Any inquiry concerning this communication or earlier communications from the examiner should be directed to Gregory P. Hein whose telephone number is 571-272-4180. The examiner can normally be reached on M-F 8-4:30.

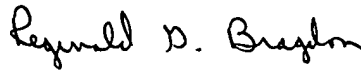
If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Mano Padmanabhan can be reached on 571-272-4210. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Art Unit: 2188

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

11/21/2005
Gregory Hein




RAYMOND D. BRAGDON
PRIMARY EXAMINER